

**Appl. No. 09/432,338  
Att. Docket No. 10191/1157  
Response To Office Action of 05/21/03**

**REMARKS**

Claims 1 to 7 are canceled, claims 8 to 90 are added, and therefore claims 8 to 90 are now pending.

New claims 8 to 90 do not add any new matter and are supported in the specification.

With respect to paragraph 4 of the Office Action, claims 1 to 7 were rejected under 35 U.S.C. § 102(e) as anticipated by or alternatively as obvious under 35 U.S.C. § 103(a) over Lutz, U.S. Patent No. 6,017,017. With respect to paragraph 5 of the Office Action, claims 1 to 7 were rejected under 35 U.S.C. § 102(e) as anticipated by or alternatively as obvious under 35 U.S.C. § 103(a) over Li, U.S. Patent No. 5,942,892. With respect to paragraph 6 of the Office Action, claims 1 to 7 were rejected under 35 U.S.C. § 102(b) as anticipated by or alternatively as obvious under 35 U.S.C. § 103(a) over Smith, U.S. Patent No. 5,738,071. With respect to paragraph 7 of the Office Action, claims 1 to 7 were rejected under 35 U.S.C. § 102(b) as anticipated by or alternatively as obvious under 35 U.S.C. § 103(a) over Moyers, U.S. Patent No. 5,583,434. With respect to paragraph 8 of the Office Action, claims 1 to 7 were rejected under 35 U.S.C. § 102(b) as anticipated by or alternatively as obvious under 35 U.S.C. § 103(a) over Corso, U.S. Patent No. 5,320,123. With respect to paragraph 9 of the Office Action, claims 1 to 7 were rejected under 35 U.S.C. § 102(b) as anticipated by Rehbichler, U.S. Patent No. 5,592,921.

While the rejections may not be agreed with, to facilitate matters, claims 1 to 7 have been canceled, and new claims 8 to 90 have been added to better define the claimed subject matter. Also, the controller 130 of Figure 1 is a controller, as would be understood by a person having ordinary skill in the art, that uses the methods that are fully described and disclosed in the present application.

As regards the presently claimed subject matter, when voltage is applied to an electromagnetic load circuit, the current flowing through the load circuit increases in accordance with an exponential function. If the load circuit is embodied as a solenoid valve, the valve needle moves only after a certain period of time. The moment at which the valve needle achieves its new limit position is called a switching instant, and the interval between the onset of the triggering and the attainment of the new limit position is called the switching time. To achieve precise control of the fuel metering, the switching instant, and thus the switching time, must be determined. The switching instant may be discerned by evaluating the

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current characteristic (other variables may be evaluated as well). For this purpose, a time window is specified within which the switching instant probably falls. This means that the valve needle attains its new limit position inside this time window. Depending on the valve design, this may be the closed or the open position of the valve.

The claimed subject matter is directed to the specification of the time window. According to the claimed subject matter, the time window is specified such that the current through the load circuit does not increase beyond a threshold value. This is realized in such a way that the duration of the time window is extended if the current is less than the threshold value, and the duration of the time window is shortened if the current is greater than the threshold value.

It is respectfully submitted that any review of the references relied upon, whether taken alone or combined, makes plain that these references do not in any way describe all of the features of any of claims 8 to 90. The presently claimed subject matter is directed to solving the problem of defining a suitable duration of the time window so that it is large enough for the switching instant to be detected (such detection techniques are referred to in German Patent No. 44 20 282, as explained in the present application), and small enough so that the consumer current does not rise enough to disconnect an output stage of the consumer, such as a solenoid valve, as explained, for example, at pages 1 and 2 of the present application.

In particular, the references relied upon do not identically describe or even suggest all of the features of any of the independent claims. For example, the references do not identically describe or even suggest the feature of “defining a duration of a time window in which the electromagnetic consumer is in a closed state, *the duration being such that a switching instant of the electromagnetic consumer occurs within the time window, the switching instant being detectable within the time window, and any rise in current in the electromagnetic consumer does not disconnect an output stage of the electromagnetic consumer, wherein the time window has a starting lower time and an ending upper time, and the lower time and the upper time are each defined based on the switching instant and the duration of the time window*”, as recited in the context of each of claims 8, 24 and 53. The references also do not identically describe or even suggest the features of “determining within a time window a switching instant at which the movable element has reached a certain position”, “defining a duration of the time window so that the current flowing through the consumer during the time window does not

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exceed a threshold value", and "reducing the duration of the time window if the current is greater than the threshold value", as recited in the context of each of claims 83 and 88.

Still further, for example, it is respectfully submitted that any review of the references relied upon makes plain that they do not in any way disclose the features of operations (a) to (f) of independent claim 24, and dependent claim 54 (which depends from claim 53).

It is therefore respectfully requested that the rejections be withdrawn, since new claims 8, 24, 53, 83 and 88 are allowable, as are their respective dependent claims, so as to obviate the arguments of the Office Action.

Accordingly, claims 8 to 90 are allowable.

#### CONCLUSION

In view of the foregoing, it is believed that the rejections have been obviated, and that claims 8 to 90 are allowable. It is therefore respectfully requested that the rejections be withdrawn, and that the present application issue as early as possible.

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Respectfully submitted,

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